

BIOLOGICAL EVALUATION
WESTERN SPRUCE BUDWORM INFESTATION IN
DOUGLAS FIR, TRUE FIRS & SPRUCE
Payette National Forest
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INTRODUCTION

Epidemic populations of this defoliator have been reported on the Forest since 1953. At that time, activity was confined to the Big Creek drainage, and was considered a portion of the "Salmon River Infestation" because of more extensive damage that was occurring on the adjacent Salmon and Challis National Forests. Control was undertaken with aerial application of DDT on 98,000 acres in 1956 and 542,300 acres in 1957.

Infested acreage and damage estimates for 1958 are not available. However, in 1959, 5,000 acres were heavily defoliated in Profile Creek outside the Idaho Primitive Area. This was the only infestation reported that year. None were recorded in 1960. Since 1961, the budworm infestation has increased in damage intensity and acreage affected to a record 400,100 acres this year.

General Information

Insect - Western Spruce Budworm, Choristoneura occidentalis Freeman.

Host Trees - Douglas fir, Pseudotsuga menziesii var.

glauca (Mirb.) Franco

Grand fir, Abies grandis (Dougl.) Lindl.

Subalpine fir, Abies lasiocarpa (Hook.) Nutt.

Engelmann Spruce, Picea engelmannii Parry.

Location - Entire Forest, except the Weiser Ranger District.

Type of Damage - Annual defoliation of varying intensity, localized top killing of mature trees, and scattered dying of suppressed understory.

Extent of Infestation - Widespread throughout the Forest within host type, with the exception of the Weiser Ranger District, totaling an estimated 400,100 acres in 1972.

Biological Information

In 1963 a systematic egg mass survey was initiated to predict defoliation intensity for the coming year. The initial system was based on studies conducted in other Regions. Actual defoliation was then measured the following year to make a determination for accuracy. Periodic adjustments have been made, and the practice of checking predicted defoliation by actual damage was discontinued in 1971. Egg mass data with defoliation predictions by sample location for 1973 are shown in Table 1.

The current infestation around McCall was first observed during aerial detection surveys in 1968. Heaviest defoliation predicted for 1973 extends from Payette Lake northwest into the upper portion of the Little Salmon River drainage (Goose Creek).

Top kill has occurred in grand and subalpine fir from McCall north along the river to the upper Payette Lake. Similar damage has also been recorded along the entire South Fork of the Salmon River from Mackay Bar south to the Forest boundary, including tributaries in the lower Secesh River drainage from Split Creek lookout to Oompaul Creek. Extensive top killing has occurred in major tributaries of the main Salmon River from Dog Town east to Warren Creek.

Discussion

For purposes of comparative reporting, the Forest was arbitrarily divided into eleven infestation areas in 1967 (see map). Table 2 shows the fluctuations in budworm damage by area since that time. Figure 1 illustrates the extent and intensity of defoliation on the Forest since 1961.

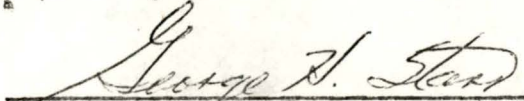
Although epidemic populations of spruce budworm have been recorded on the Forest for nearly 20 years, very little data on stand impact is available. This summer, a survey was undertaken to collect information on type and severity of damage associated with this infestation. Although the analysis is not complete, Table 3 reflects partial and total tree mortality and stand composition measured in three locations. A separate report is in preparation discussing mortality and reductions of radial and terminal growth.

Recommendations

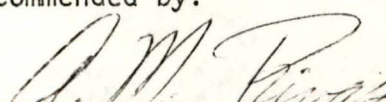
Further evaluation studies relating to measurements of cumulative damage will be continued and should shed light on planning management objectives when total budworm impact is more fully understood. Most severely threatened operable stands should be considered for logging.

Chemical control measures are not recommended.

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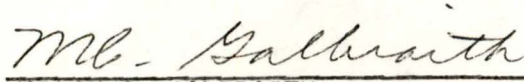

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Table 1.

WESTERN BUDWORM EGG MASS SURVEY
Payette National Forest
1972

Plot	No. New Masses Per Plot		1973 Defoliation Prediction	Trend
	1971	1972		
Big Creek	63	26	41- 55%	Decreasing
Brown Creek	N.S.	16	41- 55%	
Elk Creek	N.S.	40	41- 55%	
N.E. Payette Lake	61	60	56-100%	Static
Jackie Creek	N.S.	0	0- 25%	
Sister Creek	8	19	41- 55%	Increasing
Warren Summit	32	35	41- 55%	Increasing
Goose Creek	55	60	56-100%	Increasing
Paddy Creek	16	34	41- 55%	Increasing
Split Creek	10	5	26- 40%	Decreasing
Wagon Bay	38	58	56-100%	Increasing
Boulder Creek	26	20	41- 55%	Decreasing
Browns Pond	13	3	0- 25%	Decreasing
Hat Creek	6	1	0- 25%	Decreasing
Cow Creek	3	1	0- 25%	Decreasing

Table 2.

DAMAGE INTENSITY AND ACRES INFESTED IN 11 AREAS
ON THE PAYETTE NATIONAL FOREST 1967-1972

	L	M	H		L	M	H
Big Creek				Upper So. Fk. Salmon R. (Krassel)			
1972	174,500	6,500	-	1972	8,200	4,600	1,100
1971	39,600	20,300	2,600	1971	11,700	1,900	800
1970	12,000	-	-	1970	14,400	8,800	900
1969	71,900	26,300	2,600	1969	11,400	5,400	2,100
1968	57,700	41,800	1,700	1968	8,400	-	-
1967	43,200	7,900	-	1967	None observed		
Secesh R.				So.F. Salmon R. Mackay to Secesh			
1972	6,600	5,300	2,700	1972	14,200	4,400	100
1971	8,700	3,800	400	1971	15,600	1,600	-
1970	6,600	6,100	300	1970	5,200	2,300	-
1969	13,100	5,600	4,300	1969	17,600	17,200	200
1968	7,120	1,120	2,120	1968	20,480	2,920	-
1967	-	4,000	2,720	1967	1,520	-	-
Main Salmon Mackay-Riggins				Little Salmon R.			
1972	11,100	20,000	2,500	1972	44,100	7,000	-
1971	51,800	10,200	11,300	1971	19,800	32,900	5,700
1970	17,400	15,700	400	1970	29,900	14,300	2,900
1969	24,900	23,000	18,600	1969	21,300	15,900	900
1968	29,800	23,640	1,920	1968	7,680	-	-
1967	18,520	1,920	-	1967	None observed		
Payette R. (No.Fork)				*Wild Horse R. & Tributaries			
1972	29,500	16,400	500	1972	9,700	-	-
1971	36,900	16,300	3,200	1971	6,000	-	-
1970	34,000	14,200	400	1970	5,600	700	-
1969	24,600	19,300	-	1969	12,200	1,200	-
1968	13,480	-	-	1968	1,000	-	-
1967	None observed			1967	None observed		

Table 3.

INCIDENCE OF CUMULATIVE DAMAGE TO TWO HOST TYPES OF WESTERN SPRUCE BUDWORM
FROM THREE SAMPLE LOCATIONS ON THE PAYETTE NATIONAL FOREST - 1972

Sample Location	Number of Plots	<u>Douglas fir</u>				<u>Grand fir</u>				<u>Other Species</u>			Total Stand T/A
		<u>Live</u>		<u>Top Kill</u>		<u>Live</u>		<u>Top Kill</u>		<u>Live</u>			
		T/A	%	T/A	%	T/A	%	T/A	%	T/A	%		
Fall Creek (Salmon R.)	10	17.8	7.5	6.4	2.7	39.0	16.5	121.0	51.1	52.7	22.2	236.9	
Railroad Saddle	20	33.6	33.8	0.6	0.6	8.8	8.8	10.2 ^{1/}	10.2	46.3	46.5	99.5	
Goose Creek	20	27.8	23.1	1.2 ^{1/}	1.0	39.3	32.7	15.9 ^{1/}	13.2	36.0	30.0	120.2	

^{1/} Includes less than one tree per acre mortality attributed to budworm damage.

PAYETTE NATIONAL FOREST
ACREAGE DEFOLIATED BY INTENSITY
BY WESTERN SPRUCE BUDWORM
1961-1972

